



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,073	12/23/2004	Atsushi Fukui	MAM-056	7337
20374	7590	06/07/2007		
KUBOVCIK & KUBOVCIK SUITE 710 900 17TH STREET NW WASHINGTON, DC 20006			EXAMINER LEE, CYNTHIA K	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 06/07/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/519,073

Applicant(s)

FUKUI ET AL.

Examiner

Cynthia Lee

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-8, 13-15, 17 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-8, 13-15, 17 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Response to Arguments

This Office Action is responsive to the amendment filed on 3/29/2007. Claims 2-8, 13-15, 17, and 20-22 are pending. Applicant's arguments have been considered and are persuasive. Thus, claims 2-8, 13-15, 17, and 20-22 are rejected for reasons stated herein below.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 2-8, 11, 13-15, 17, 20-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, 6-9, 12, 19, 21, 24, 41, and 75-77 of copending Application No. 10/363039. Although the conflicting claims are not identical, they are not patentably distinct from each other. Claims 2-8, 11, 13-15, 17, 20-22 of the instant application is anticipated by copending

Art Unit: 1745

application claims 1-4, 6-9, 12, 19, 21, 24, 41, and 75-77 in that claims 1-4, 6-9, 12, 19, 21, 24, 41, and 75-77 of the copending application contains all the limitations of claim of the instant application. Claim 2-8, 11, 13-15, 17, 20-22 of the instant application therefore is not patently distinct from the copending claim and as such is unpatentable for obvious-type double patenting. Although the copending claims do not expressly recite the mechanical properties of a current collector and a binder as claimed in the instant application, it is deemed to have been met by a process in which a surface roughened copper foil current collector and the binder are sintered below the decomposition temperature and above the glass transition temperature of the binder as recited in the copending claim 1.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 2-8, 11, 13-15, 17, 20-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 3, 4, 6-9, 12, 19, 21, 24, 41, and 75-77 of copending Application No. 10/673348. Although the conflicting claims are not identical, they are not patentably distinct from each other. Claims 2-8, 11, 13-15, 17, 20-22 of the instant application is anticipated by copending application claims 3, 4, 6-9, 12, 19, 21, 24, 41, and 75-77 in that claim 3, 4, 6-9, 12, 19, 21, 24, 41, and 75-77 of the copending application contains all the limitations of claim of the instant application. The mechanical properties recited in the instant claim 2 are deemed to have been met by a process in which a surface roughened copper foil

Art Unit: 1745

current collector and the binder are sintered below the decomposition temperature and above the melting temperature of the binder as recited in the copending claims. Claim 2-8, 11, 13-15, 17, 20-22 of the instant application therefore is not patently distinct from the copending claim and as such is unpatentable for obvious-type double patenting.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Specification

The disclosure is objected to because of the following informalities:

It is unclear how the binder $\alpha 1$ differs from binder $\beta 1$ since both binders are produced by the same procedure of Experiment 1 and in both binders used polyamic acid and heat treated to produce polyimide from polyamic acid and the polyamide content, by weight, in the active material layer was 18.2% (refer to pgs. 19 and 30).

Further, it is unclear how binder $\alpha 2$ differs from $\alpha 3$ (pg 30 of specification). In other words, it is unclear the binder $\alpha 3$ (the "other" thermoplasticpolyimide) is compositionally different from binder $\alpha 2$.

Applicant argues that the difference physical properties among the binders are clearly identified in Tables 2 and 6. It is unclear to the Examiner how the different properties were obtained by the same process for binder $\alpha 1$ and binder $\beta 1$ (see experiment 1).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Art Unit: 1745

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2-8, 13-15, 17, 20-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not disclose as to what are the different polyamic acids that were used to prepare polyimide for binders $\alpha 1$ and $\beta 1$. Also, the specification does not disclose how thermoplastic polyimide of $\alpha 2$ differs from $\alpha 3$.

It appears that the amount of direction, the number of working examples, and the breadth of claims are not commensurate in scope with the disclosure as originally filed. Hence undue experimentation would be required to determine what the different polyamic acids or thermoplastic polyimide are used to make the invention as claimed.

With respect to enablement commensurate in scope with the claims, section 2164.08 of the MPEP states:

"The Federal Circuit has repeatedly held that 'the specification must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation'. In re Wright, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)... The determination of the propriety of a rejection based upon the scope of

Art Unit: 1745

a claim relative to the scope of the enablement involves two stages of inquiry. The first is to determine how broad the claim is with respect to the disclosure. The entire claim must be considered. The second inquiry is to determine if one skilled in the art is enabled to make and use the entire scope of the claimed invention without undue experimentation."

Factors to be considered when determining whether the claimed invention would require undue experimentation are given in MPEP 2164.01 (a). In re Wands, 858 F. 2d 731, 737; 8 USPQ 2d 1400, 1404 (Fed. Cir. 1988). Only the relevant factors will be addressed for determining undue experimentation of the presently claimed invention. The relevant factors are (A) the breadth of the claims; (B) the amount of direction provided by the inventor; (C) the existence of working examples, (D) the level of predictability in the art; and (E) the quantity of experimentation needed to make or used the invention based on the content of the disclosure.

Factor (A) Breadth of the claims:

Claim 2 claims the mechanical properties of a binder. Specification pgs 18 and 19 state that binder α 1 was produced by the heat treatment of polyamic acid from mixing 8.6 wt% N-methylpyrrolidone solution containing 19.8 parts by weight of polyamic acid. Pg 30 states that binder β 1 was made by polyamic acid.

Applicant asserts that polyamic acid used in α 1 and β 1 were different polyamic acids (pg 9 of Remarks). Applicant has not disclosed the different polyamic acids used to make this invention. Further, no guidance is given to direct one in the art to the different polyamic acids to make the binders to arrive at the mechanical properties as

Art Unit: 1745

claimed by the Applicants. Further, Applicants have not disclosed how thermoplastic polyimide of binder $\alpha 2$ differs from polyimide of binder $\alpha 3$.

Factor (B) The amount of direction provided by the inventor.

Applicant has not disclosed the different polyamic acids used to make this invention. Further, no guidance is given to direct one in the art to the different polyamic acids to make the binders to arrive at the mechanical properties as claimed by the Applicants.

Factor (C) The existence of working examples:

No working example is given to direct one in the art to the different polyamic acids to make the binders to arrive at the mechanical properties as claimed by the Applicants.

Factor (D) The level of predictability in the art:

It appears that different mechanical properties are achieved by using different forms of polyamic acid. Thus, there is a level of unpredictability in the art with respect to obtaining a binder with certain types of mechanical properties.

With respect to the relationship of predictability of the art and the enablement requirement, MPEP 2164.03 states:

"The amount of guidance or direction needed to enable the invention is inversely related to

Art Unit: 1745

the amount of knowledge in the state of the art as well as the predictability in the art. In re Fisher, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970). The "amount of guidance or direction" refers to that information in the application, as originally filed, that teaches exactly how to make or use the invention. The more that is known in the prior art about the nature of the invention, how to make, and how to use the invention, and the more predictable the art is, the less information needs to be explicitly stated in the specification. In contrast, if little is known in the prior art about the nature of the invention and the art is unpredictable, the specification would need more detail as to how to make and use the invention in order to be enabling. >See, e.g., Chiron Corp. v. Genentech Inc., 363 F.3d 1247, 1254, 70 USPQ2d 1321, 1326 (Fed. Cir. 2004)... The "predictability or lack thereof" in the art refers to the ability of one skilled in the art to extrapolate the disclosed or known results to the claimed invention. If one skilled in the art can readily anticipate the effect of a change within the subject matter to which the claimed invention pertains, then there is predictability in the art. On the other hand, if one skilled in the art cannot readily anticipate the effect of a change within the subject matter to which that claimed invention pertains, then there is lack of predictability in the art. Accordingly, what is known in the art provides evidence as to the question of predictability... However, in applications directed to inventions in arts where the results are unpredictable, the disclosure of a single species usually does not provide an adequate basis to support generic claims. In re Soll, 97 F.2d 623, 624, 38 USPQ 189, 191 (CCPA 1938). In cases involving unpredictable factors, such as most chemical reactions and physiological activity, more may be required. In re Fisher, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970)[emphasis added]."

Factor (E) the quantity of experimentation needed to make or used the invention based on the content of the disclosure.

This factor has been addressed by factors (A)-(C) above.

Thus, the claims are properly rejected for scope of enablement since the two stages of inquiry as set forth in MPEP section 2164.08 have been fully addressed herein by the Examiner.

Applicant argues that it is irrelevant whether or not the specifics of the polyamic acids and polyimides used in the experiments in the present application are described, if the person of ordinary skill in the art could otherwise practice the invention. Applicant argues that to properly support the rejection, the Office must provide proper evidence or reasoning supporting its position that a person of ordinary skill in the art could not, based on the knowledge in the art, generally, obtain polyimides or other binders having the properties recited in claim 2 without undue experimentation. Applicant argues that evidence of known unpredictability or lack of knowledge concerning the preparation of polyimides, is necessary to show that undue experimentation is required to practice the present invention.

In response,

MPEP 2164 states that:

The purpose of the requirement that the specification describe the invention in such terms that one skilled in the art can make and use the claimed invention is to ensure that the invention is communicated to the interested public in a meaningful way. The information contained in the disclosure of

an application must be sufficient to inform those skilled in the relevant art how to both make and use the claimed invention. (emphasis added)

MPEP 2164.04 states that:

In order to make a rejection, the examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. In re Wright, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993) (examiner must provide a reasonable explanation as to why the scope of protection provided by a claim is not adequately enabled by the disclosure). A specification disclosure which contains a teaching of the manner and process of making and using an invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as being in compliance with the enablement requirement of 35 U.S.C. 112, first paragraph, unless there is a reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. Assuming that sufficient reason for such doubt exists, a rejection for failure to teach how to make and/or use will be proper on that basis. In re Marzocchi, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). As stated by the court, "it is incumbent upon the Patent Office, whenever a rejection on this basis is made, to explain why it doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions of its own with acceptable evidence or reasoning which is inconsistent with the contested statement. Otherwise, there would be no need for the applicant to go to the trouble and expense of supporting his presumptively accurate disclosure." 439 F.2d at 224, 169 USPQ at 370. According to In re Bowen, 492 F.2d 859, 862-63, 181 USPQ 48, 51 (CCPA 1974), the minimal requirement is for the examiner to give reasons for the uncertainty of the enablement. This standard is applicable even when there is no evidence in the record of operability without undue experimentation beyond the disclosed embodiments. See also In re Brana, 51 F.3d 1560, 1566, 34 USPQ2d 1436, 1441 (Fed. Cir. 1995) (citing In re Bundy, 642 F.2d 430, 433, 209 USPQ 48, 51 (CCPA 1981)) (discussed in MPEP §2164.07 regarding the relationship of the enablement requirement to the utility requirement of 35 U.S.C. 101). While the analysis and conclusion of a lack of enablement are

Art Unit: 1745

based on the factors discussed in MPEP § 2164.01(a) and the evidence as a whole, it is not necessary to discuss each factor in the written enablement rejection. The language should focus on those factors, reasons, and evidence that lead the examiner to conclude that the specification fails to teach how to make and use the claimed invention without undue experimentation, or that the scope of any enablement provided to one skilled in the art is not commensurate with the scope of protection sought by the claims. This can be done by making specific findings of fact, supported by the evidence, and then drawing conclusions based on these findings of fact. For example, doubt may arise about enablement because information is missing about one or more essential parts or relationships between parts which one skilled in the art could not develop without undue experimentation. In such a case, the examiner should specifically identify what information is missing and why one skilled in the art could not supply the information without undue experimentation. See MPEP §2164.06(a). References should be supplied if possible to support a prima facie case of lack of enablement, but are not always required. In re Marzocchi, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). However, specific technical reasons are always required. (emphasis added)

The Examiner is not persuaded by Applicant's arguments.

The Examiner notes that a description of the specifics of the polyamic acids and polyimides used in the experiments in the present application is very relevant to the enablement issue because one would not be able to make the invention without the specifics of the polyamic acids and polyimides. Although Applicant argues that it is not necessary if the person of ordinary skill in the art could otherwise practice the invention, the Examiner's position is that person of ordinary skill in the art would not be able to make the invention without the specifics of the polyamic acids and polyimides.

Contrary the Applicant's arguments, the Examiner notes that evidence of known unpredictability or lack of knowledge concerning the preparation of polyimides, is not necessary to show that undue experimentation is required to practice the present invention. The Examiner has the burden of providing a sound basis as to why the invention as claimed cannot be made (refer to MPEP cited above), and not known unpredictability or lack of knowledge, which was fully addressed (see the Wands factors addressed above). Further, Applicant has not provided any evidence proving predictability or knowledge of making various types of polyimides using various polyamic acids, but merely provided arguments.

Claims Analysis

The limitation "the current collector is subject to heat treatment before the active material layer is provided on the surface of the current collector" was considered, but was not given patentable weight because the courts have held that the method of forming the product is not germane to the issue of patentability of the product itself. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Applicant argues that heat treatment of a metallic foil can cause structural changes. However, the Examiner notes that the heat treatment of the current collector prior to providing the active material layer is solely for the purposes of analyzing the properties of the current collector without the presence of the active material layer. The Specification pg 5 line 23 states that "[i]t is difficult to measure mechanical properties of the current collector after the sintering treatment, because it then carries the active

Art Unit: 1745

material layer thereon to constitute the negative electrode. Instead, the current collector before the sintering treatment can be separately subjected to the same heat treatment as the sintering treatment and then measured to determine such mechanical properties."

The Examiner acknowledges that sintering imparts structural changes. However, the process in which "the current collector is subject to heat treatment before the active material layer is provided on the surface of the current collector" is not part of the manufacturing process. It is an analytical technique to measure the mechanical properties of the current collector.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-8, 13-15, 20-22 are rejected under 35 U.S.C. 103(a) as obvious over Nobufumi (JP 2000-012088) in view of Solomon (US 4927514), as evidenced by the glass transition point and melting point of polytetrafluoroethylene, retrieved from the Internet www.scientificpolymer.com/catalog/description.asp?QproductCode=203 on 3/23/2007.

Nobufumi discloses a negative electrode and a rechargeable lithium battery comprising a mixture of silicon-containing anode material, carbon material, and a binder. The mixture is prepared and a base material made of a foil or mesh of

Art Unit: 1745

conductive metal is coated with the mixture to form a coated film. The coated film is sintered in a non-oxidizing atmosphere, thereby integrating a sintered material of the coated film with the base material. Nobufumi discloses that the base material is a electrolytic copper foil. The rechargeable lithium battery includes a positive electrode material and a nonaqueous electrolyte. The particle size of the silicon-containing compounds is from 0.01 um to 100 um. (See abstract, [0005, 0007, 0011, 0020, 0032-39, 0058-0061]) Nobufumi discloses that the conductive metal foil thickness is between 3 and 100 um. The current collector has a roughness of 0.03 to 1 um. Nobufumi discloses that the thickness of the anode active material is between 10-1000 um and depends on the magnitude of the cell [0040]. Further, the binder used is polyvinylidene fluoride. The glass transition temperature is 30 C and the melting temperature is 158 C (see reference attached).

In Example 28, the surface roughness of the current collector is 1 um [0066]. The thickness of the active material and current collector are the same as that of Example 1. The thickness of the active material is 30 um. The thickness of the current collector is 20 um [0061]. Nobufumi meets the range $5Y \geq X$ and $250Ra \geq X$ as claimed by the applicants in which X is the thickness of the active material layer, Y is the thickness of the current collector, and Ra is the surface roughness of the current collector.

Nobufumi does not disclose sintering at a temperature higher than a glass transition temperature of the binder (claim 2) and lower than the decomposition temperature of the binder (claim 11). Nobufumi does not disclose the mechanical

Art Unit: 1745

properties as claimed in claim 2. However, Solomon teaches an electrode in which an active material mixture is deposited onto the support layer (4:65-5:20). The resulting layer is then sintered to provide an electrode structure consisting of a support layer and an active layer. Typically, this sintering is conducted at a temperature sufficiently low to not cause any deleterious polymer decomposition, e.g., when PTFE is present in both the support layer and the active layer, heating can be at a temperature within the range of from about 280 C to 350 C. Generally, sintering temperatures will not exceed above about 350 C. The Examiner notes that the glass transition temperature for PTFE is 130 C and the melting temperature for PTFE is 327 C (see attached). It would have been obvious to one of ordinary skill in the art at the time the invention was made to sinter Nobufumi's negative electrode as modified by Solomon, in a temperature range that does not cause deleterious polymer decomposition, such as above the glass transition temperature but below the decomposition temperature. Because it is commonly known in the art that the polymer chains possess mobility on a microscopic level above its glass transition temperature, one would be motivated to sinter above the glass transition temperature for the benefit of diffusing the binder material into the active material for adhesion purposes.

The mechanical properties recited in claim 2 are deemed to have been met by a process in which a surface roughened copper foil current collector and the binder are sintered below the decomposition temperature and above the melting temperature of the binder.

Claim 17 is rejected under 35 U.S.C. 103(a) as obvious over Nobufumi (JP 2000-012088) in view of Solomon (US 4927514) as evidenced by the glass transition point and melting point of polytetrafluoroethylene, retrieved from the Internet www.scientificpolymer.com/catalog/description.asp?QproductCode=203 on 3/23/2007 as applied to claim 2, further in view of Gan (US 2002/0094480).

The combination of Nobufumi and Solomon teaches that the binder is a polyvinylidene fluoride and does not teach that the binder is a polyimide. However, Gan teaches of an electrode with a binder material which is preferably a fluoro-resin powder such as polytetrafluoroethylene (PTFE), polyvinylidene fluoride (PVDF), polyethylenetetrafluoroethylene (ETFE), polyamides, polyimides [0015]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Nobufumi's polyvinylidene fluoride for Gao's polyimide because PVDF and polyimide are art recognized equivalents as a binder material. See MPEP 2144.06.

Response to Arguments

Applicant's prior art arguments filed 3/29/2007 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ckl

Cynthia Lee

Patent Examiner

Susy Tsang-Foster
Susy Tsang-Foster
Supervisory Patent Examiner